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| EXAMINER |
|----------------|
| PATEL, HETUL B |

| ART UNIT | PAPER NUMBER |
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| 2186 | |

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/733,553

Applicant(s)

LAM ET AL.

Examiner

Hetul Patel

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 10-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 10-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 12, 2006 has been entered and carefully considered. Claims 1-3, 5, 10-12, 18, 20, 21, 26-29 and 32 are amended; and claims 1-5 and 10-34 are presented again for examination.
2. Applicant's arguments filed on September 12, 2006 have been fully considered but they are not persuasive.
3. The rejection of claims 1-5 and 10-34 as in the previous Office Action is respectfully maintained and reiterated below for Applicant's convenience.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 10-24 and 32-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The elements "the first processor" and "the second processor" for performing specific steps as disclosed in independent claims 10, 18 and 32 are not described in the specification of the instant application. Claims 11-17, 19-24 and 33-34 are also rejected for the same reason(s) as they further limit the claims 10, 18 and 32.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 10-11, 13, 18, 20, 25-26, 28-29, 31-32 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Polfer et al. (USPN: 6,665,779) hereinafter, Polfer.

As per claim 1, Polfer teaches a method for replicating data from a storage device (i.e. the in Fig. 1), comprising identifying one or more allocated storage locations (i.e. the blocks B0-B3 in Fig. 3A; B0-B23 in Fig. 3B; BE0-BE23 in Figs. 5A-5B) on the storage device (i.e. 100 in Fig. 1A) based, at least in part, on a file system associated

with the storage device (e.g. see Figs. 1A, 3A-3B and 5A-5B). Polfer further teaches that each block (i.e. each of BE0-BE23 in Fig. 5B) in the storage device (i.e. 500 in Fig. 5B) includes a flag (i.e. flag in Fig. 5B) indicating whether the corresponding block is to be backed up/replicated (i.e. by marking used/unused flag). The further step of recording is inherently taught by the Polfer because in order to determine whether the “used” or “unused” flag should be assigned to a particular block, the particular block needs to be read (i.e. I/O access by performing a read operation) first to determine whether data exist in it or not and then each block get recorded as either the “used” or “unused” flag based on if it’s backed up, i.e. read, i.e. I/O access is performed (e.g. see Col. 8, lines 21-31 and Fig. 5B). Polfer further teaches about identifying, based on the recorded I/O access information (i.e. based on the recorded flags in Fig. 5B which are generated by performing at least one read (I/O access) operation), one or more data blocks on the storage device that contain valid data; and replicating the data blocks that contain valid data (e.g. see Col. 8, lines 32-40 and Fig. 5B).

As per claim 2, Polfer teaches the claimed invention as described above and furthermore, Polfer teaches that the at least one read operation includes reading metadata (i.e. flags) associated with one or more files (i.e. blocks of clusters/data) on the storage device (e.g. see Col. 5, lines 15-23).

As per claims 10 and 11, see arguments with respect to the rejection of claims 1-2, respectively. Claims 10 and 11 are also rejected based on the same rationale as the rejection of claims 1-2, respectively.

As per claims 18 and 20, see arguments with respect to the rejection of claims 1-2, respectively. Claims 18 and 20 are also rejected based on the same rationale as the rejection of claims 1-2, respectively.

As per claims 26, 29 and 32, see arguments with respect to the rejection of claims 1-2. Claims 26, 29 and 32 are also rejected based on the same rationale as the rejection of claims 1-2.

As per claim 13, Polfer teaches the claimed invention as described above and furthermore, Polfer teaches that a computer associated with the storage device (e.g. see Col. 5, lines 30-40).

As per claim 25, Polfer teaches the claimed invention as described above and furthermore, Polfer teaches that the file system is structured on a file level (e.g. see Col. 5, 33-38).

As per claim 28, 31 and 34, Polfer teaches the claimed invention as described above and furthermore, Polfer teaches that the list and the replicated data blocks are stored in a memory (i.e. a backup medium) (e.g. see Col. 8, lines 32-40 and Fig. 5B).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 12, 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polfer in view of Long et al. (USPN: 2003/0195865) hereinafter, Long.

As per claim 3, Polfer teaches the claimed invention as described above. However, Polfer does not teach that reading metadata includes reading the name of the file, access permissions to the file, the date of creation of the file, and dates of modification of the file. Long, on the other hand, teaches that information about files is generally referred to as the file system "metadata". Examples of metadata associated with files are: (1) a document's name, creation date, last modified date (2) permissions for accessing the document, and (3) the folder path for accessing the document (e.g. see paragraph [0010]). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to modifying Polfer's method by including the step of reading information about file, such as name, access permission, date of creation and date of modification, as taught by Long. In doing so, it can be determined which specific data block(s) are valid and based on that those data block(s) is/are replicated. Therefore, it is being advantageous.

As per claims 12, 21 and 27, see arguments with respect to the rejection of claim 3. Claims 12, 21 and 27 are also rejected based on the same rationale as the rejection of claim 3.

7. Claims 4-5, 14-17, 19 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polfer in view of Neufeld (USPN: 5,668,971).

As per claim 4, Polfer teaches the claimed invention as described above.

However, Polfer failed to teach the further limitation of cleaning a cache on a computer associated with the storage device before performing any read operations. Neufeld, on the other hand, teaches about cleaning/flushing the cache memory (i.e. the combination of 24 and 28 in Fig. 1) prior to performing any read operations (e.g. see Col. 3, lines 58-65). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the cleaning step of Neufeld in the method taught by Polfer. In doing so, it will prevent any attempts to fill (invalid) data from the cache memory in response to the read request.

As per claim 5, Polfer teaches a method for replicating data from a storage device as described above in the rejection of claim 1. However, Polfer failed to teach the further limitation of cleaning a cache on a computer associated with the storage device before performing any read operations. Neufeld, on the other hand, teaches about cleaning/flushing the cache memory (i.e. the combination of 24 and 28 in Fig. 1) prior to performing any read operations (e.g. see Col. 3, lines 58-65). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the cleaning step of Neufeld in the method taught by Polfer. In doing so, it will prevent any attempts to fill (invalid) data from the cache memory in response to the read request.

As per claims 15 and 19, see arguments with respect to the rejection of claim 4. Claims 15 and 19 are also rejected based on the same rationale as the rejection of claim 4.

As per claims 14, 16-17 and 22-24, the combination of Polfer and Neufeld teaches the claimed invention as described above. The further limitations of having, the (first) processor residing on the computer, the (second) processor is configured to manage the storage operations of the computer, the (second) processor comprising the filter driver (i.e. the software program) and, the (second) processor is part of a storage management system, are inherently embedded in the system taught by Polfer.

8. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polfer in view of van Rietschote (USPN: 6,757,778) hereinafter, Rietschote.

As per claims 30 and 33, Polfer teaches the claimed invention as described above. However, Polfer failed to teach that the file system is associated with a virtual storage device used to manage storage of data on the storage device. Rietschote, on the other hand, teaches about associating the file system with a virtual storage device used to manage storage of data on the storage device (e.g. see the abstract). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the teachings of Rietschote in the method and system taught by Polfer since if the storage management system supports a set of storage commands for the virtual storage devices, the storage management system can schedule various applications/operating systems for execution on multiple processing hardware, and present a consistent view of storage for a given application/operating system, independent of which of the multiple processing hardware on which the application/operation system is executing.

Remarks

9. As to the remark, Applicant asserted:
- (a) With respect to claims 10-24, the rejection under 35 USC 112 is improper and should be withdrawn because the specification provides clear and unambiguous support for the claimed limitations, i.e. the “first processor” and the “second processor”.
 - (b) Polfer does not teach or suggest “recording one or more I/O accesses performed with respect to the storage device in association with the at least one read operation” or “identifying, based on the recorded I/O access information, one or more data blocks on the storage device that contain valid data,” as required by amended claims 1 and 10. (Emphasis added).
 - (c) Polfer does not teach or suggest “perform at least one read operation on a storage device based on information in a file system associated with the storage device,” and “instruct the first processor to record one or more I/O accesses performed with respect to the storage device in association with the at least one read operation”, as required by claim 18.

Examiner respectfully traverses Applicant's remark for the following reasons:

With respect to (a), Examiner would like to point out to Applicant that Examiner did not find support for the claimed limitations, i.e. the “first processor” and the “second processor”, in the specification at the sections indicated by Applicant, i.e. page 3, lines 18-20; and page 7, lines 7-10, 11-17. The indicated portion of the specification

discusses about the first and second software programs but nor about the first and second processor as claimed in the pending claims 10-24. Therefore, the 35 USC 112 rejection is maintained.

With respect to (b) and (c), Polfer clearly teaches that each block (i.e. each of BE0-BE23 in Fig. 5B) in the storage device (i.e. 500 in Fig. 5B) includes a flag (i.e. flag in Fig. 5B) indicating whether the corresponding block is to be backed up/replicated (i.e. by marking used/unused flag). The further step of recording is inherently taught by the Polfer because in order to determine whether the “used” or “unused” flag should be assigned to a particular block, the particular block needs to be read (i.e. I/O access by performing a read operation) first to determine whether data exist in it or not and then each block get recorded as either the “used” or “unused” flag based on if it’s backed up, i.e. read, i.e. I/O access is performed (e.g. see Col. 8, lines 21-31 and Fig. 5B). Polfer further teaches about identifying, based on the recorded I/O access information (i.e. based on the recorded flags in Fig. 5B which are generated by performing at least one read (I/O access) operation), one or more data blocks on the storage device that contain valid data; and replicating the data blocks that contain valid data (e.g. see Col. 8, lines 32-40 and Fig. 5B).


Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PIERRE BATAILLE
PRIMARY EXAMINER
9/18/06